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Wright's Man and the Glacial Period.¹—This book is the best synopsis of present knowledge of the glacial epochs and its relations to human history which has yet appeared. The compass of the work necessarily does not permit as great detail as would be appropriate to a technical monograph, but it is admirably adapted for the purpose for which it is designed, i. e., that of giving the greatest amount of information in a readable form in the smallest space. The treatment of disputed topics is generally judicial, and the author has brought to bear on the subject a great wealth of facts not only from all published sources, but also from his own original research in North America and Europe. A question of much general interest is that of the age of the great ice period. He brings together evidences from various observers to show that its close cannot have been more than 15,000 years ago, and that its duration may have been twice as long. The basis of this estimate is the rate of cutting of various post-glacial gorges, of which well-known examples are that of the Niagara River, and that of the Mississippi below the falls of St. Anthony. This shortened time is in remarkable contrast to the estimate made by the geologists who first attacked the problem.

The portion of the book relating to the antiquity of man is the smaller half, but the conclusive evidences of man's existence during the glacial epoch are necessarily local. Such evidence as this is handled judiciously, and all objections are duly considered. Professor Wright is of the opinion that some of the finds which indicate the existence of man during the glacial epoch are trustworthy evidence to that effect. He cites especially as American localities, Trenton, New Jersey, (Abbott); Newcomerstown and Madisonville, Ohio; Little Falls, Minnesota, Miss Babbitt; Nampa, Idaho, and Calaveras Co., California. These finds will be mentioned again below. He considers the supposed finds of human implements in beds of Neocene age as not established.

Dr. Wright's book has been made the object of a vigorous attack by the geologists of the U. S. Geological Survey in a way which shows an animus on their part not strictly scientific. President Chamberlin in the *Chicago Dial*, charged the author with improperly alleging on the title page that he was an assistant on the U. S. Geological Survey. To this Dr. Wright replied that he was so employed at the time the book was written and demonstrated satisfactorily his right to use the title assistant. One of the other criticisms was regrettably free from the amenities which should characterize scientific discussion, while others

¹Man and the Glacial Period by G. Frederick Wright, D.D. LL.D. International Scientific Series No. LXIX. New York, D. Appleton & Co., 1892.

exaggerated unimportant details, and ignored the general value and utility of the book. To all this Dr. Wright has replied temperately and convincingly.

The ethnologists of the Bureau at Washington have made destructive criticisms of the evidence for glacial man contained in the book. Probably the most expert makers in the world of human implements of the stone age are Messrs Holmes and Maguire of Washington. They show convincingly that it is easier to make neolithic or pecked and polished stone implements, than to make fine chipped flints of paleolithic type. Hence they conclude that either the order of age should be reversed, or that paleoliths and neoliths are of con-

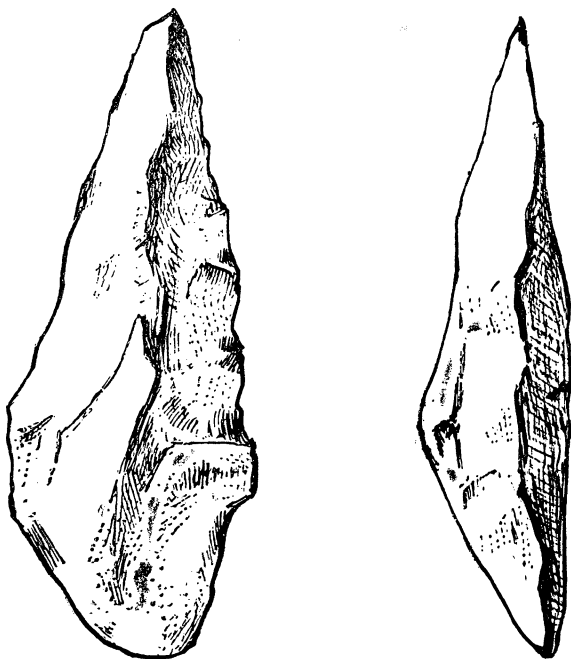


FIG. 1.

Fig. 1. Argillite implement found by Dr. C. C. Abbott, March, 1879 at K. K. Rowan's farm, Trenton, N. J., in gravel 16 feet from surface. From G. F. Wright's *Man and the Glacial Period*.

temporary age, and that the absence of neolithic implements from some deposits is simply due to accident or to the soft material of which such implements were made. This conclusion, if correct, revolutionizes prehistoric archeology. These gentlemen think that it should be

revolutionized, and that paleolithic man in both Europe and North America is a myth. The great collections of 'paleoliths' of the turtle-back and Chelléen types they look upon as cores and rejects of pieces from which better implements have been made and taken away. This view leads them to look with suspicion on the alleged discoveries of glacial man, and Mr. Holmes has accordingly written articles discrediting the finds described in Dr. Wright's book.

It may be remarked *apropos* of the observations of Messrs Holmes and Maguire, that though it may be true that pecked and ground implements are more easily made than well chipped flints their actual relations in time can only be ascertained by stratigraphic and paleontologic research. A flint broken once or twice so as to produce an edge is more easily made than a neolith, and gives a great deal better edge, so that such implements may very probably have antedated the latter, while the finer ones are well-known to have been neolithic, and have been made up to the present day. The question is however, not which implement ought to have come first, but which actually did come first.

As regards the finds in Europe, those of the caves are the result of so much careful investigation, and are characterized by such satisfactory stratigraphic conditions, that they cannot be impeached by observations made in this country. The paleoliths and human bones have been conclusively shown to belong to the age of the glacial fauna. In North America the paleontologic evidence is not so good, but such as there is, indicates strongly that the earliest known American was not more modern than the paleolithic European. Those who saw the Calaveras skull when first found, allege that it was more or less covered with the adherent cement so characteristic of the gold bearing gravel of California. The age of this gravel is not exactly determinable, since data respecting the finding of fossils in it are not generally reliable. But that it is of approximately glacial age no one doubts. Mr. Holmes believes that the implements of the Abbott and Babbitt finds occur only in the talus, and are not from the undisturbed glacial gravels (*American Geologist*); but so far as regards part of the Babbitt, and all of the Abbott finds, other observers hold a different opinion. In the *Journal of Geology* he shows that the evidence for the stratigraphic position of the finds at Madisonville and Newcomerstown, Ohio, is defective. It may be added here that the Nampa image, whatever may be its real stratigraphic origin, displays in its form an artistic skill on the part of its maker, not to be looked for in primitive man; nevertheless it is time that the name of the person who alleges

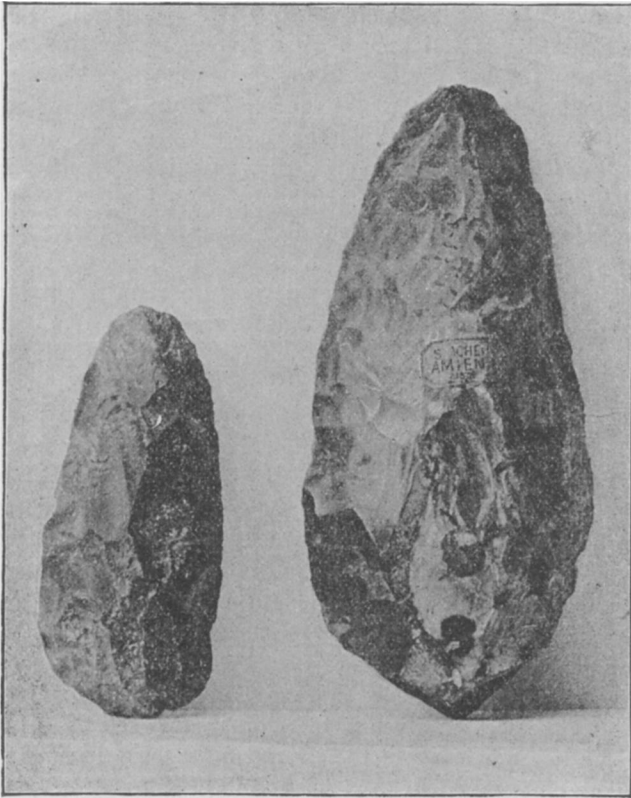


FIG. 2.

Fig. 2. Smaller figure, paleolith from Newcomerstown, Ohio; larger figure do from Amiens, France; both one-half size. From G. F. Wright's *Man and the Glacial Period*.

that he intentionally deceived Professor Wright in this matter, be produced; and the authority for the statement that such an assertion was made, should make himself known. The image cannot well be the work of any existing Indian tribe, as has been asserted. In any case it seems that the evidence for Plistocene man in America, must be further investigated with careful methods, and under more favorable circumstances than are furnished by most of the so-called glacial gravels.

We give figures of two characteristic types of paleoliths; one of argillite found by Abbott at Trenton, N. J.; and one flint from Newcomerstown, Ohio.

E. D. COPE.